PLAY METER

UPDATE EDITION

Volume 6, Number 12 July 1, 1980

'Better servicing in plans' — Atari source

Atari cuts off some distribs

By RAY E. TILLEY

Atari, Inc. has enforced a new "limited distribution" realignment of distributors, cutting off several domestic handlers from the product line and adding three Europeans and one new Florida distributor.

The total of Atari handlers is now 80, said a company spokesman. The domestic addition is Rowe International, Inc. in Jacksonville, Florida. Atari's plan was to have "more order in the network" and to tie service information from the factory more closely to distribution of the games.

Atari National Sales Manager Don Osborne said the adjustments would "enhance the quality of distributorships to better handle the Atari line." Along with limiting its network—which did not produce exclusive regional handling of Atari product in all cases—the company was also gearing in early May to establish higher standards of servicing and repair of its game line, according to Osborne.

The Sunnyvale, California manufacturer was evidently moving toward exclusive-distributorship marketing of its games. And this approach left some of the reduced handlers less than pleased.

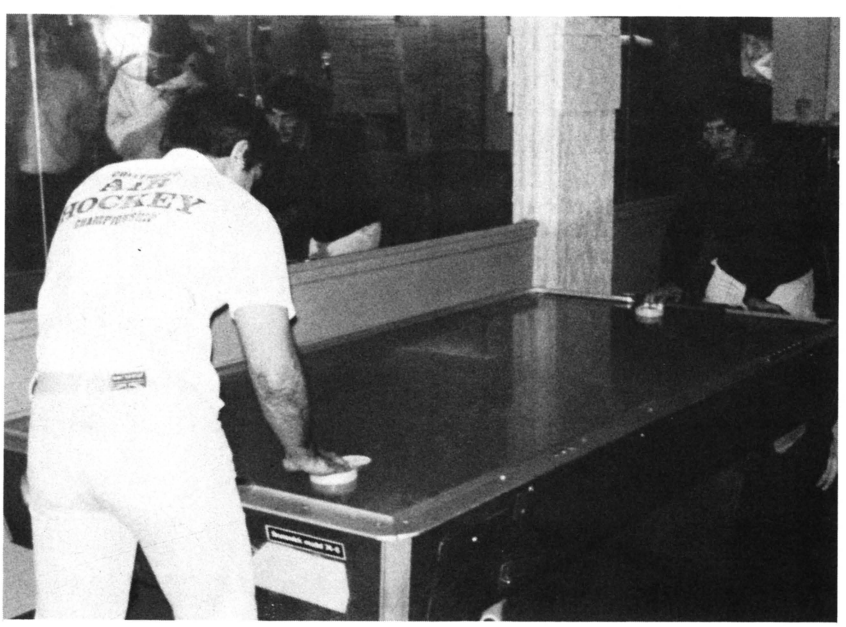
One of the cut-out handlers, Dan G. Perrotta of Allcoin Equipment in San Antonio, commented to PLAY METER: "I'm not appreciative of the changes—but I can understand it if you say money is all that matters." [Allcoin has handled the Atari product line for more than five years.]

Osborne, however, said there were several advantages in Atari's plans for the select distrib network. Schooling will be provided, he said, on service of Atari games, from the technical basics to the more sophisticated technology in the latest videos and pingames—for example, service schools will deal with "the uniqueness of the Quadrascan x-y monitor" [manufactured by Electrohome Electronics]. Atari hopes to beef up the "responsiveness" of the factory to the buyers of its game line, said Osborne.

New distributors other than Rowe of Jacksonville were: Lars Berg, Trodheim, Norway; Raha-automaattiyhdists, Helsinki, Finland; and Music Hire Group, London.

Among the reduced distributorships which made comments to PLAY METER, the consensus of opinion seemed to be that Atari, Inc. was selecting those handlers which could buy "carload" quantities of games. Slow delivery of equipment bought in smaller quantities, such as twenty, was another comment from their side.

One said a move to exclusive distributorships indicated a trend in the industry: "I think the manufacturers are blowing us little distributors out of the way." This source relies on his own exclusive line of jukeboxes more heavily than his game units. However, he said he saw his removal from the distributor network as "heavy-handed."



In the recent National Air Hockey Championships in Pennsylvania, Phil Arnold (left) of Houston edged No. 3-ranked Joe Campbell of Philadelphia. Victorious over all was Jesse Douty of Philadelphia in the event set up by Play-a-Way Arcade in State College, Pennsylvania. *See story, page 7.*

Update Edition

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Irish seminar hosts 40

Coin Operated Amusements Ltd. of Dublin Road, Kildare, Ireland recently hosted about forty operators in an NSM Juke Box Technical Seminar.

The seminar was particularly concerned with the *Festival ES 160* and the new electronic system which has been developed over the past few years by NSM. The *Festival ES 160* is completely computerized and uses some of the most advanced technology to serve operator, site owner, and customer.

NSM juke boxes are manufactured at Bingen-Rhine, West Germany and the world distributors are Lowen Automaten of Bingen. The seminar was conducted by NSM technical director Rupert Mosinger, and most of those attending operate NSM juke boxes.

Over the past two years, sales of juke boxes have increased and it is expected that with the new technology and the advantages to operators that more operators will become involved in the phonograph end of the coin-op business in the future, said Mosinger.

Coin Operated Amusements Ltd. are also Irish agents for Electrocoin Video Games (U.K.), Universal Video Games (Japan), Recel pingames (Spain), Compu-Game Amusement Machines (U.K.) and Micro Electronic Systems (Ballylinian, County Kildare), who recently commenced production of video games, the first of which is called *The Poker Game* and has become popular with operators since it came on the market, early in 1980.

Coin Operated Amusements took part in Coin Op '80, the first Amusement Trades Exhibition, which was held at the Leopardstown Exhibition Center, April 22 to 24, 1980, displaying the agency's complete range of equipment.

A detailed report on Coin Op '80 by PLAY METER's International Editor David Snook, will be included in the July 15 issue of PLAY METER.

† † †

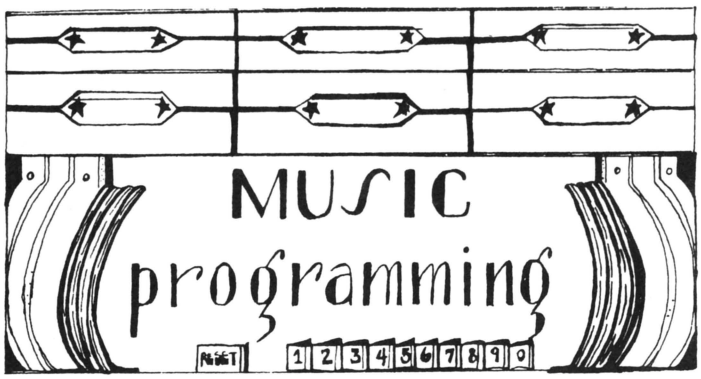
DUBLIN—The Republic of Ireland's first-ever coin machine trade exhibition April 22-24 proved very successful as a show—and it presented a platform on which Ireland's two trade associations could push their case for relaxing laws on slot-machine operations.

Pressure for change in the Irish gaming laws to permit a more widespread, but controlled, use of slots was a central theme in the Coin Op 80 show. There were, however, few slots at the exhibition at Leopardstown Racecourse. Of the 65 exhibitors at the show, 26 of them were from the coin operated amusement machine business.

The Irish trade's experimental joint exhibition (Irish Amusement Trades Association with Irish Amusement Caterers Association) was unquestioned as a large success for a first year's effort.

A review of the Coin Op 80 show will appear in the July 15 issue of PLAY METER, as filed from Dublin by International Editor David Snook.

Atendees at the recent NSM technical seminar in Kildare, Ireland hear Martin Dempsey, sales manager of Coin Operated Amusements Ltd. and Rupert Mosinger (right), technical director of NSM.



By Pat Matthews

Program Director
WQUE New Orleans

Rainy night hits

It's just another rainy night in Old New Orleans, the city that drains forgot. Lord knows, we've had our share of April showers. Anyway, here I am at the typewriter, just thinking about all the hits I've predicted in the past year and wondering how long this string of genius can continue.

HAPPY TOGETHER (A FANTASY) — THE CAPTAIN & TENNILLE — NB 2264D

First of all, get and play the short version. Then get ready for a re-make of the old Turtles hit with a quasi-disco beat replete with male, bass-voiced background grumblings, female soprano background dribblings and Daryl Dragon (the Captain) going beserk on his synthesizer. It sounds like some kind of Ferrante & Teicher plays "All Your Disco Favorites" or something equally as awful. One listen and you'll be sure to want to hear the original version, scratches and all. As negative as this all seems, I still award this excercise in production techniques a 7 out of 10.

POWER — THE DOOBIE BROTHERS WITH JOHN HALL & JAMES TAYLOR — Asylum E-46630-A

Quite an impressive line-up, huh? Well, they didn't get together in the studio. It's just another attempt to sell some records of music make at the "No-Nukes" benefit. The album which this cut is taken from has turned out to be a mild disaster (no pun intended). It's the "anthem", I guss, of the entire anti-nuclear movement. It's a nice song with timely lyrics and you can even tell the famous person singing at the time. I was so observant, I recognized Carly Simon's voice and she's not listed on the single. I give this one an outside chance with a 6 out of 10.

BAR ROOM BUDDIES — MERLE HAGGARD AND CLINT EASTWOOD — Elektra E-46634-A

Merle Haggard and who? Bet you didn't know Clint Eastwood could sing. Neither did I—after I listened. It's a nice little country song that features Merle Haggard's whiskey laced tones, great fiddle work and an excellent pedal steel guitar riff. It's a short song (2:14) and the length appropriately reflects Mr. Eastwood's future in music. Stick to acting, please, Clint? C & W 8 out of 10 or better.

MY MISTAKE — THE KINGBEES — RSO RS 1032

Here's some New Wave rock n' roll in 4/4 time and is the Eighties' answer to Chuck Berry. That's it! The guitar work sounds like Chuck Berry's. If you like rock n' roll in its rawest form, the Kingbees are for you. Personally, I find it sort of refreshing. Could go high as 7 out of 10.

I DON'T WANNA GET DRAFTED — FRANK ZAPPA — Zappa Records ZR-1001-A

This is a great example of Zappa's musical genius and clever humor combing to yield interesting listening. It's distributed by CBS because Frank's parent company, Mercury, wouldn't touch it. I think that's stupid. It's not obscene, it's only one man's opinion of an issue set to music. And whether you're pro or anti draft, you can't help but laugh at this one. Going nowhere, but valuable juke box product. No rating. Wait'll you hear what his sister says.

LET ME LOVE YOU TONIGHT — PURE PRAIRIE LEAGUE — Casablanca NB 2266

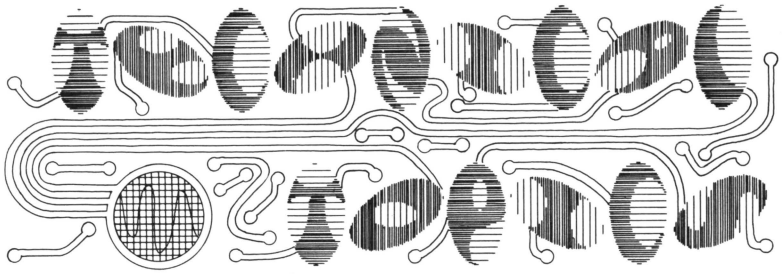
This is what I call a good record as well as a good song. The production and mix is excitingly perfect. It's a great melodic song with good lyric content. So what you have here is a veteran band with a combination of their old sound, a new record company and a new musical outlook. Not to mention a well deserved bright future. Check out the sax, it's excellent. Positive commercial smash! 10 out of 10.

ALL NIGHT LONG — JOE WALSH — FULL MOON — Asylum E-46639-A

From the new John Travolta movie "Urban Cowboy", here's the first in a long line of hit singles to come from the soundtrack. Joe Walsh shines on this rock and country "party" type record. It's aimed at the stay up all night and get smashed set. It'll definitely be a favorite in lots of places and you don't has to be a cowboy, urban or otherwise, to like to have a good time. It could turn into a rallying cry for the summer of 1980 and that shouldn't hurt the sales of the record or the tickets at the box office. 10 out of 10.

MEDLEY OF HITS — DIANA ROSS & THE SUPREMES — Motown PR 69A

If you liked the songs in the Sixties, you'll love them in the Eighties, Nineties, or until you die. Carefully and nicely edited together. Important record for dancing or oldies establishment or for people who want four memories on one 45 RPM record. 6 out of 10, if that much.



By William Arkush

PART III

Semiconductor device technology

The who's who family mentioned in Part I of this article [UPDATE, May 1, 1980] refers to the technologies of the processes more than the applications of the device itself. The MOS family has many derivatives within the process but generally they are used for creating logic functions. The MOS structures act as a gating mechanism which makes these devices significant for digital system processing. Computers being the best example of this means in no way that digital signal process is limited, for it is now deeply embedded in all branches of the electronics, commercial, and consumer industries.

MOS technology—metal oxide semiconducter—is not generally suited for analog signal processing or timing applications. However, the manner in which the junctions of the chips are doped will create the variations in the type of the device.

This means the MOS technologies —being C-D-N-P or VMOS and MOSFETs (MOS field effect transistors) allow the devices fabricated from these processes to be used in many applications. MOSFETs are used in the front end of tuners and radios while NMOS is used to fabricate microprocessors (CPUs) and all sorts of host hardware.

DMOS is used to make static RAM memories and CMOS is used to create non-volatile dynamic and static memories.

Othern families of logic include the bi-polar junctions where current is directed through a semiconductor material in the forward biasd mode due to its low resistance in the junction. When the junction sees a high resistance, the current flow is limited accordingly by the intrinsic value of the junction.

This high resistance, low current flow is known as reverse bias and is the basis for the function and performance of digital logic devices. When a gate sees a 1-state as differentiated from an O-state, the device reacts, depending on the elemrnt type. In essence then, the transistor/transistor logic TTL and diode /transistor logic (DTL) are those bipolar junction structures which react to biases and current flows and thereby gate signals digitally as they respond to the changing states at the input.

Although there are basic gate types, the computer industry has created a demand so heavy on the device manufacturers that the types and functions are so numerous it would be virtually impossible to list all of them.

I mentioned earlier gates, counter, drivers, buffers, registers, multiplexers, demultiplexers, and others. That is why all shops that are up to par have data books on the device types and a semiconductor reference manual. An absolute necessity, the technician's library has become an as the bandpass of his oscilloscope. "You can't tell the players without the program."

PROM and ROM memories are a different story, however. The system comes with the PROMs or ROMs and no information on the software. This means our only hope is that it works and is reliable. There are very few methods for testing PROMs a PROM or ROM in the field, short of substituting the parts. It is a part with a fixed program which we generally have no access to, and there is virtually no way to test a device without burning a program or comparing its program with anm identical copy.

If you want to test a memory part in the field, in circuit, you need an expensive system emulator or a signature analyzer if the signatures are available. A better way is to test the semiconductor junctions of the memory device or any other semiconductor device, in or out of circuit with a reactance analyzer.

The Parametric Analyzer by UWC, Inc. is an oscilloscope add-on which allows you to determine the condition of a device under test on a non-powered circuit board. This instrument removes the need to substitute parts or to shotgun a repair. It removes the guesswork in troubleshooting integrated circuits, meories, and other semiconductor junctions such as transistors and diodes.

Analog devices range from power transistors, power regulators, on-amp, comparators, linear amplifiers, phase lock loops, timers, function generators, and oscillators, to mention a few.

The same theory applies, referring to biasing their junctions except that in digital signal processing, you turn on and off the device extremely rapidly to accomodate the clock which drives the system. But in alalog electronics, you have an amplitude oriented system which must track according to a variable input applied to the device. Stereo amplifiers and Servo amplifiers are excellent examples of components designed to accept a wide range of inputs and produce a governed output. The analog world, as the digital electronic world, depend entirely on the circuit die which drive them.

All indicators still point us back to the little chip of silicon which makes

our whole electronics world continue to evolve.

CHIP PROBLEMS

As I discussed previously, the areas of concern are internal to the device. The wire bonds are perhaps the most important, tending to dislodge themselves when subjected to extreme force, like someone dropping a circuit board.

Another area is the die-attach adhesion between the chip die and the substrate material. In plastic packages the substrate material is a metal such as timed phosphor bronze or Kovar (industrial gold) or a treated nickel steel. The adhesion problems occur if the package has lost its hermetic seal.

Occasionally, the lead frame is soldered in place in ceramic packages. The solder could oxydize, causing a crystallization of the solder joint and the electricval-to-mechanical interface would be looking into an extremely high resistance. This would yield an open output or a noisy input of an integrated circuit. Basically, it would be the proverbial "cold solder joint." But, aside from the package and assembly problems, the bulk of the failures will be caused by the failure of the silicon die. There are an overwhelming number of considerations that could be discussed having to do with the nature of failures of an integrated circuit die.

What I would like to highlight are the major considerations and not the process considerations. Component failure due to a process problem breaking down is extremely probable and therefore a real consideration.

However, the types of problems of which we will typically experience are due to the failure of a junction. Most logic devices are comprised of a multitude of transistor sections which interreact to produce the gating effect.

As an end product, the inputs and outputs of a semiconductor device are routed through sections of transistor arrays which react according to a table known as Boolean logic. This TTL mathematical array does nothing more than perfom like a multi-legged traffic cop.

But beneath it all is the single transistor and all the transistors which comprise the cell of the logic unit. When you reduce a complex array to a single cell, the transistor, you can see there is a unique commonality. Since a transistor is in fact a dual diode in its own right,it has predictable characteristics of its junctions. When in *thought*, you reduce a complex I.C. to the state of a multitude of dual diodes, and you can see the commonality: they all share a reference plane.

In TTL devices the reference plane is typically GND, the emitter side of the output. Specifically, it is common reference and electron source from which the device junction shares its electrons with the output. This migration of electrons from the source to the drain is the principle of the semiconductor junction. How the junction is doped is, in essence, the resistance which effects the flow of current from the source to the drain—emitter to collector.

In a true semiconductor material, the resistance of the junction changes with the current flow. Whatever method is used to modulate or gate the current flow from the emitter to the collector is a function of the bias supplied to the base of the transistor cell. The significant item is that all cells share at least one reference plane with each other and to its own junction structure.

Therefore, it is possible to test all the junctions in a device because whatever junction has malfunctioned will affect the current flow in the circuit cell which is being tested.

This effect may be catastrophic like a short, or subtle like an infinite impedance indicating an *open*.

These circuit cells are the building blocks for logic devices. Even though a single cell like a transistor can be reduced to a dual diode equivalent, the fact remains that the junctions are susceptible to electrical problems as well. Overvoltage will zap a junction in nothing flat because the two conductive layers of the junction have arched their way through the thin dielectric dopant or passifying layer. Another typical problem is the device's sensitivity to transient spikes of energy and spurious transmissions of signals through cross-talk (multipath). These problems can create a situation whereby the signal potential is so great for a fraction of a second that electron mobility is seriously affected. The electrons become forced out of their orbitals and into another atom's outer ring.

This establishes an ionic path whereby the adjacent atoms become depleted of source electrons and therefore are not able to pass on electrons when needed. In essence, the current path has become open because of more holes present that electrons to fill them.

The end result looks like a P-type material and the internal resistance is too high to conduct. Besides shorts and opens there are dynamic problems, especially in memories that require refresh or components which require strobe pulse. Dynamic problems are those which do not manifest themselves under heavy load, in-circuit and after it is warmed up.

Typically, what occurs is the breakdown of an oxide layer which is used to separate or space apart to adjacent monolithic circuit traces. Minute crack and fractures in the passification layer of material will allow electron migration through ion exchange to gather free electrons when available. Eventually there is enough of a current path that a signal will walk astray using the skin effect of transmitted signals.

Then there are the hair line cracks in metalized areas which expand when heated and therefore would open a circuit leg. The expansion characteristics of semiconductor materials are known as the thermal co-efficient of expansion (TCE).

When materials are used to make an interconnection it is known as the thermal co-efficient of coupling (TCC). Both of these areas are subject to problems if the chemistry employed in the fabrication process was poorly monitored, carelessly implemented, inadvertently confused or altered. And, of course, a wide range of operator-induced problems through the possible misuse of the equipment can occur, even if only for a split second.

That part which slips through the inspection people during fabrication or assembly will undoubtedly wind up on your bench. Whether it is a PROM, digital, or linear device, that faulty part will be waiting for you tomorrow. How are you going to deal with it?

Since our choices are relatively limited, in diagnosis procedures or even component fault analysis, what

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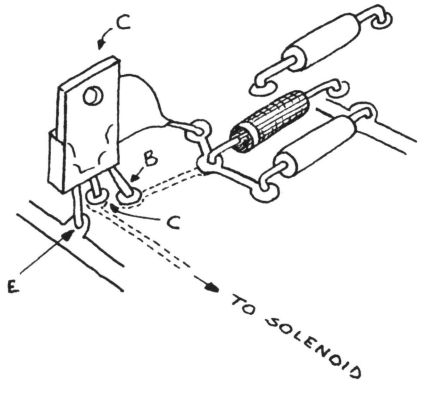


OOPS!

Two illustrations in the Technical Topics section of PLAY METER, April 15, 1980 indicated the wrong *terminal denominations for the SE9302 and similar transistors. (Illustration here corrects the terminal designations.) This diagram was mislabeled in "A common pinball problem," page 63, figure 3, of the April issue. We all apologize. —Editor*

On the move

Bally taps two

Bally Pinball Division has announced the appointment of JoAn Mason as manager of marketing administrtion and research for the division. She brings extensive experience to her job as she has been a familiar associate to the amusement machine industry for the past nine years, said Tom Nieman, vice president of marketing for Bally Pinball.

Mason

Guzzi

Prior to joining the staff at Bally Pinball, Ms. Mason served in the same capacity in Bally's Consumer Products Division for 2 ½ years and she also had the position of assistant director of sales for Midway Manufacturing, 1976-77.

Ms. Mason will work closely with Nieman and the Bally Pinball distributor network in all marketing functions. She is located at the division's Bensenville, Illinois plant.

‡ ‡ ‡

Diane Guzzi has been appointed to the position of customer relations assistant for the Bally Pinball Division. Under Bernie Powers' direction, she will be responsible for all incoming service calls and will also work in obtaining distributor and operator feedback on Bally's pingames.

Prior to joining Bally, Ms. Guzzi was with Citicorp Credit Services and Ramada Inn Corporation.

She is single and currently working toward a degree at Elmhurst College.

Rains moves up

Lyle Rains has been appointed director of engineering for Atari's coin-operated games division, according to Gene Lipkin, president. Rains succeeds Noah Anglin, who recently assumed the duties of vice president of engineering and manufacturing for the division.

In commenting on the promotion, Anglin said: "We're very pleased to have Lyle in this most important position. His creative talent, technical expertise and thorough knowledge of the industry are one of Atari's most valuable assets. His experience and leadership will help Atari engineers continue to develop the industry's leading games."

In his new position, Rains will have overall responsibility for all facets of engineering design and development for the Sunnyvale, California company. He has held various design engineering positions over the past six years with Atari, serving most recently as manager of electrical engineering.

Rains has designed many of Atari's more popular games and holds various design patents in video game technology.

He holds a 1973 BSEE degree from the University of California at Berkeley.

Rains

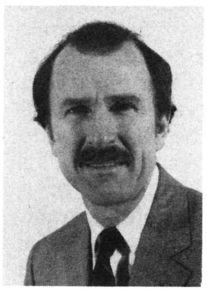
Breaks

Breaks named

In recognition of the contribution Shane Breaks has made to the growth of Belam Export Corp., and in accordance with his increasing responsibilities in the international trade, Brakes has been named vice president of R.H. Belam Company.

In making the announcement, Belam's Executive Vice President Marc Haim said Breaks' primary responsibility would be the international sales of all coin-operated machines.

Haim said, "As our business has become more truly international, the necessity to make on the spot decisions has become more and more essential. The executive responsibility demonstrated by Shane in the three years since he joined us makes this promotion especially gratifying for all of us."



Ruehl

Wood

Ruehl appointed

Venguard, a division of the Vendo Company, has appointed Mark Ruehl as manager of its Accessory-Supply Department. Mr. Ruehl replaces Dale Quigley, who accepted a position with American Automatic Merchandiser.

Prior to joining Venguard, Ruehl was associated with Top Value Corp. as Midwest director of sales.

Also at Venguard recently, Tele-Serv representatives appointments included Ms. Jeanne Goreham, Ms. Ellen Fogel, and Ms. Charlotte Wood.

The Venguard Accessory-Supply Department provides a line of items used in the repair, maintenance, and operation of vending, music and games machines, and billiard equipment.

Dugan picked

Empire Distributing, Inc. has announced the appointment of Dick Dugan as branch manager of the Indianapolis division. He has served for six years in the Indianapolis sales department and will succeed Joe Patterson, who resigned effective May 1.

John Ard, formerly a Rowe regional manager, will join the Indianapolis staff as assistant branch manager.

Arcade hosts air-hockey champs

Play-a-Way Arcade, in State College, Pennsylvania, hosted the 1980 National Air-Hockey Championships, held on April 12-13. The tournament featured $1,000 in prizes plus trophies, provided by player entry fees ($25) and the arcade. Games were set on free play for the tournament.

Jesse "the Kid" Douty of Philadelphia, the '78 and '79 national champion, again emerged victorious. Phil Arnold of Houston was runner-up for the third year in a row. After being knocked into the loser's bracket by Douty, Arnold came back and defeated Douty 5 games to 4, setting the stage for a final set. The games were close, but Douty won the deciding set 5 games to zero, taking advantage of numerous pop-outs and an offensive let-down by Arnold.

Joe Campbell of Philadelphia utilized a strong forehand game to capture third place, coming from behind to defeat Mark Robbins of Boulder, Colorado, who was the fifth place finisher. Both Campbell and Robbins were returning to air-hockey action following long lay-offs due to injuries. Mike Barry of Philadelphia took the 4th place spot. Rounding out the top 10 were: 6—Keith Sapanski, State College; 7—Robert Hernandez, Houston; 8—Ken Foehringer, State College; 9—Michael Dickstein, State College; 10—Don Metzler, Houston.

Jim Johnson, co-owner of Play-a-Way, said he was very pleased with the tournament. "The air-hockey players are a great bunch—they're not rowdy and they respect the machines," he said.

Johnson credited Michael Dickstein, a local player, for his efforts in organizing the event. "I would like to have another big tournament here in the future," Johnson said. Play-a-Way regularly holds local tourneys in foosball, pinball, and video games.

Another national-level air-hockey tournament is planned for the fall, in Texas or Colorado. For further information, contact: U.S. Air-Table Hockey Association, P. O. Box 25338, Houston, Texas 77005.

TECHNICAL TOPICS

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are we going to do to shorten the time of repairs? The well-dressed and groomed shop will have at least one power-up station (test fixture), at least one dual trace oscilloscope (DC to 50 mhz), one Parametric Analyzer (reactance analyzer) per scope, a large library on component parts and whatever schematic you are fortunate to obtain.

All the device problems we have talked about and all the technologies of the processes and all the families of logic can easily be tested by the analyzer.

As I view the shop and its mode of operation in the near future, they will have to establish stalls if they don't already have them. This will allow greater efficiency in the repair traffic. The shop will develop specialists in machine types and brands. Most factories have employed some sort of state-of-the-art technology in their machines so the service man will be trained by functional repairs.

Unfortunately, this will tend to separate the theoretical testing stations from the routine maintenance and repair by substitution service methods. There will be more minor maintenance stations and field service personnel being developed utilizing more sophisticated tools like a portable oscilloscope and the Parametric Analyzer. This will tend to segregate the laboratory and engineering environments even further than they are now.

The engineer who has a hard time relating to the technician now will be put further apart by the software. The technician will be relying on the factory to supply debug programs in the machines and self-test functions.

What all this means is that I predict an age of board swappers coming on. But this time it is good because we are ready for it.

PLAY METER CALENDAR

July 16-20
National Australian AMOA, Queensland, Australia

July 18-19
Montana Coin Machine Operators Association convention, Outlaw Inn, Kalispell

August 1, 2
Oregon Amusement and Music Operators Association summer fun meeting, Ashland Hills Inn, Ashland

September 19-21
North Carolina Coin Operators Association, annual convention, Radisson Hotel, Charlotte

September 26-28
West Virginia Music and Vending Association, convention, Ramada Inn, South Charleston

October 8-10
Japan Amusement Trade Association, annual convention, Tokyo

October 10, 11
Amusement and Music Operators of Virginia annual convention, Howard Johnson's, Richmond

October 23-26
NAMA National Convention/Exhibition, Bartle Hall, Kansas City, Missouri

October 31, November 1, 2
1980 AMOA Exposition, Conrad Hilton, Chicago

Classified

PARTS: I.C.C. Spitfire & Sky Tack; Marvena Mine Sweeper. We have a complete inventory including logic boards. BILL GROSSMAN & ASSOCIATES, Box 5421, Incline Village, NV 89450. Tel. 702/831-2990.

WANTED: Coin entry plate for Williams 3 in 1 coin chute reading 2 nickels or 1 dime 1 play—3 plays for 25 cents. ROB BERK, 704 Perkinswood, NE, Warren, OH 44483. Tel. 216/369-1192.

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PENNY ARCADES: Write to us for free brochures and information about our products that will make money for you. HANNA MFG. CORP., Waterville, NY 13480. Tel. 315/841-4112.

FOR SALE: Bally Fireball, excellent condition, also have a large selection of late clean pinball and video games. Call or write PARAMOUNT AMUSEMENT COMPANY, 85 Crestwood Blvd., Poughkeepsie, NY 12603. Tel. 914/473-2477.

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WANTED: Backglass for Gottlieb, Queen of Diamonds [1959] in excellent condition. PETER LEUPOLD, 4020 St. Johns Road #11, Dollard, Quebec, Canada.

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WANTED: Old/antique slot machines and parts. Will pick-up. JACKPOT AMUSEMENTS, 14216 Clark Street, Riverdale, IL 60627. Tel. 312/849-4041.

NEW PORTABLE COIN COUNTER-BELITA LIGHTweight, $395. Tel. 1-800-433-2908; 1-800-772-2703, Texas Watts.

WANTED: Backglass for Keeney's Three Way Bonus Super Bell Console Slot, R.R. BOULDEN, 10305 E. Mapledale Street, Bellflower, CA 90706.

WANTED: DEALERS AND REPS, Protected territories and market available for the Intercard System. See page 97, January issue. For additional information contact INTEC, 28061 Front Street, Suite 8, Rancho California, CA 92390. Tel. 714/676-2883.

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